

## CLAIMS

What is claimed is:

1. A method for manufacturing a magnetic write element for use in a data recording system, comprising the steps of:
  - a. providing a first pole having a first and a second end and constructed of a magnetic material;
  - b. depositing a dielectric write gap material layer over said first pole, said dielectric write gap material layer extending to said first end of said first pole and being formed so as to leave a portion said first pole uncovered at said second end of said first pole to provide a back-gap;
  - c. depositing a mask material onto said seed layer;
  - d. patterning a coil pattern in said mask material using a photolithographic process;
  - e. selectively removing a portion of said patterned mask material to produce a recess in said mask material in said pattern of said coil;
  - f. forming a trench in said mask material adjacent said coil pattern, said trench having a depth that is shallower than that of said coil pattern recess;
  - g. baking said mask material;
  - h. depositing an electrically conductive coil into said coil pattern recess;
  - i. removing said mask material;
  - j. depositing a coil insulation layer;
  - k. curing said coil insulation layer; and
  - l. forming a second pole constructed of a magnetic material, said second pole contacting said first pole at said back-gap, and being separated from said first pole at said first end by said write gap material layer.

1 2. A method as recited in claim 1 wherein said electrically conductive coil is  
2 electroplated and further comprising the steps of:  
3 a. before depositing said mask material, depositing a thin, electrically  
4 conductive seed layer;  
5 b. after depositing said electrically conductive coil, removing said seed layer.

1 3. A method as recited in claim 1 wherein said coil material and said seed layer  
2 are copper.

1 4. A method as recited in claim 1 wherein said trench extends around said coil  
2 patterned recess in said mask.

1 5. A method as recited in claim 1 further comprising two or more of said  
2 trenches.

1 6. A method as recited in claim 1 wherein said trench has a width of 0.3 to 0.5  
2 microns.

1 7. A method as recited in claim 5 wherein said trenches are spaced roughly 0.5  
2 microns apart.

1 8. A method as recited in claim 1 wherein said trench is spaced at least 0.8  
2 microns from the outermost portion of said coil patterned recess in said mask  
3 material.

1 9. A method as recited in claim 1 wherein said coil has a pitch of at least 0.4  
2 microns.

1 10. A method as recited in claim 1 wherein said coil patterned recess in said mask  
2 material extends through said mask material, and wherein said trench does not  
3 extend through said mask material.

1 11. A magnetic write element constructed according to the process of claims 1, 2,  
2 3, 4, 5, 6, 7, 8, 9, or 10.

1 12. A data storage and retrieval system for use with a computer, the system  
2 comprising:  
3 a. a housing;  
4 b. a motor connected with said housing;  
5 c. a spindle driven by said motor;  
6 d. a magnetic disk, support by said spindle for rotation thereabout;  
7 e. an actuator connected with said housing;  
8 f. a head supported by said actuator proximal to a surface of said disk;  
9 g. a magnetic read element disposed on said head;  
10 h. a magnetic write element disposed on said head, said write element being  
11 constructed by the method of claims 1, 2, 3, 4, 5, 6, 7, 8, 9, or 10.